

PAPER • OPEN ACCESS

Non-Local Damage Modelling of Sheet Metal Forming Processes with ALE Formulation

To cite this article: O.B. Adetoro and Rui P.R. Cardoso 2016 *J. Phys.: Conf. Ser.* **734** 032146

View the [article online](#) for updates and enhancements.

Related content

- [Scattering from a separable, non-local potential](#)
R L Cassola and R D Koshel
- [Non-Local Ductile Damage Formulations for Sheet Bulk Metal Forming](#)
Steffen Beese, Stefan Loehnert and Peter Wriggers
- [Averaging of weakly non-local symplectic structures](#)
A Ya Maltsev



IOP | ebooks™

Bringing you innovative digital publishing with leading voices to create your essential collection of books in STEM research.

Start exploring the collection - download the first chapter of every title for free.

Non-Local Damage Modelling of Sheet Metal Forming Processes with ALE Formulation

O.B. Adetoro¹ and Rui P.R. Cardoso²

¹Department of Engineering Design and Mathematics, University of the West of England, BS16 1QY Bristol, UK

²Department of Mechanical, Aerospace and Civil Engineering, Brunel University London, UB8 3PH Uxbridge, London, UK

E-mail: Mayo.Adetoro@uwe.ac.uk

Abstract. The modelling of material degradation due to nucleation, growth and coalescence of micro-voids is vital in sheet metal forming process due to the large deformation typically experienced by the part. Nonlocal damage modelling or nonlocal continuum is gaining a lot of interest because it is an effective approach to modelling the strain-softening, whilst avoiding the spurious localization that gives rise to strong mesh sensitivity in numerical computations. However to accurately resolve the evolving narrow bands of highly localised strain, it is necessary to use sufficient computational grids. In this paper an ALE formulation is used for modelling the localization pattern. An approach for relocating the node points is presented and explored.

